

Status of NY/NJ Harbor Nutrient/DO TMDL Plan

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NY/NJ Harbor Estuary Program TMDL Oversight
Group Meeting

HydroQual

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TMDL Plan Overview

- A plan for nitrogen and carbon reductions has been developed which meets the NY SA/SB/SC “best science” standard for dissolved oxygen in all marine waters throughout the NY/NJ Harbor for at least some portion of the year.
- For those times/locations where attainment is incomplete, other endpoints have been identified.

TMDL Plan Results

- Tabulations have been prepared for attainment of all State and federal DO standards in all waters for each grid cell (previously distributed).
- Results presented here are focused on the NY SA/SB/SC “best science” standard.
- Results include tracking of standards attainment and living marine resource metrics “mortality volume days” and “biomass reduction volume days”.

Summary of TMDL Plan Results I

Sub-Region	Attains Current Standard	Attains SA/SB/SC NY Standard	Attains Other all times/locations
Hackensack SE1	no	> 350 days	24-hr avg > 2.5 mg/L juvenile and adult survival > 0.6 mg/L
Hackensack SE2	no	>288 days mp11.4 - 3.8 yes mp 3.8 - 0.6	24-hr avg > 0.4 mg/L > 0.3 mg/L
Hackensack SE3	yes	yes	

Summary of TMDL Plan Results II

Sub-Region	Attains Current Standard	Attains SA/SB/SC NY Standard	Attains Other all times/locations
Passaic FW2- NT/SE2	yes	yes	
Passaic/ Newark Bay SE3	yes	>337 days 3 cells yes for others	24 hr avg >2.9 mg/L juvenile & adult survival >2.4 mg/L
Raritan FW2-NT	yes	yes	
Raritan River SE1	no	yes-omit 3 cells <0.2 days	3<24 hr avg<4.8 larval recruitment >1.5 mg/L

Summary of TMDL Plan Results - III

Sub-Region	Attains Current Standards	Attains SA/SB/SC NY Standard	Attains Other all times/locations
Raritan Bay SE1	no	>342 days (24 cells) yes (34 cells)	24 hr avg >2.7 mg/L juvenile & adult survival > 0.6 mg/L
Raritan Bay I	no	yes	
Raritan Bay SA	yes (almost)	yes (omit 2 cells < 0.5 days)	3.0<24 hr avg<4.8 mg/L larval recruitment > 2.5 mg/L
Raritan Bay SB	yes	yes	

Summary of TMDL Plan Results - IV

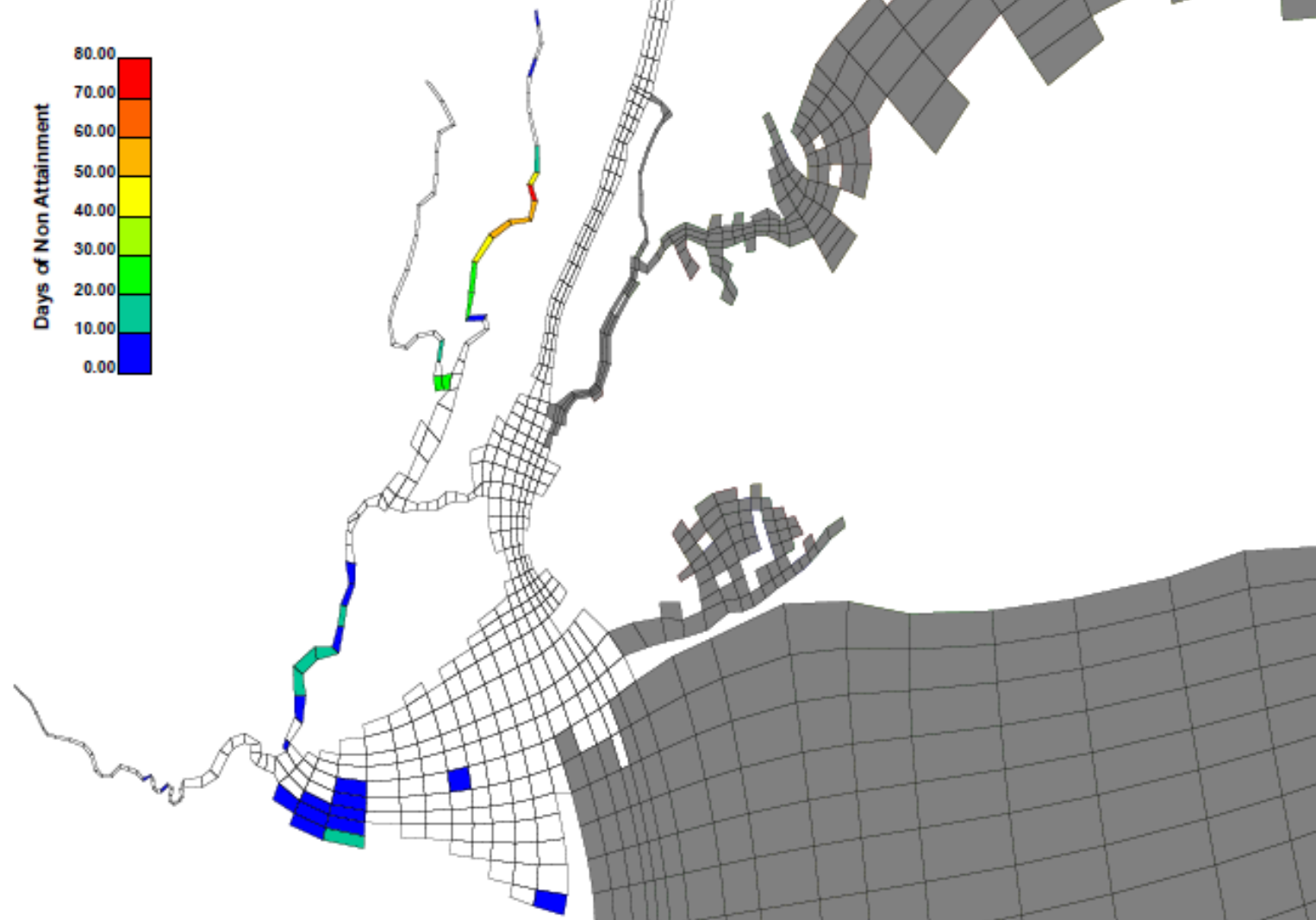
Sub-Region	Attains Current Standards	Attains SA/SB/SC NY Standard	Attains Other all times/locations
Kill van Kull	yes	yes	
Arthur Kill SD/SE3	no	>345 days mp 15 – 8.3 yes mp 8.3 to 4.1	24-hr avg >2 >1.6
Arthur Kill I/SE2	no	yes (omit 2 cells, <1 day)	3.0<24 hr avg<4.8 larval recruitment >2.3 mg/L

Summary of TMIDL Plan Results - V

Sub-Region	Attains Current Standards	Attains SA/SB/SC NY Standard	Attains Other all times/locations
Hudson SE1	yes	yes	
Hudson SB	yes	yes	
Hudson SE2	yes	yes	
Hudson I	yes	yes	
Upper Bay SE2	yes (almost)	330 days 1 cell yes all others	24 hr avg > 3.6 mg/L juvenile adult survival > 3.2 mg/L
Upper Bay I	yes	yes	

*NYS Chronic is based on 24 hour average DO.
NYS Acute is based on instantaneous DO.

With Plan, 1988 hydrodynamics

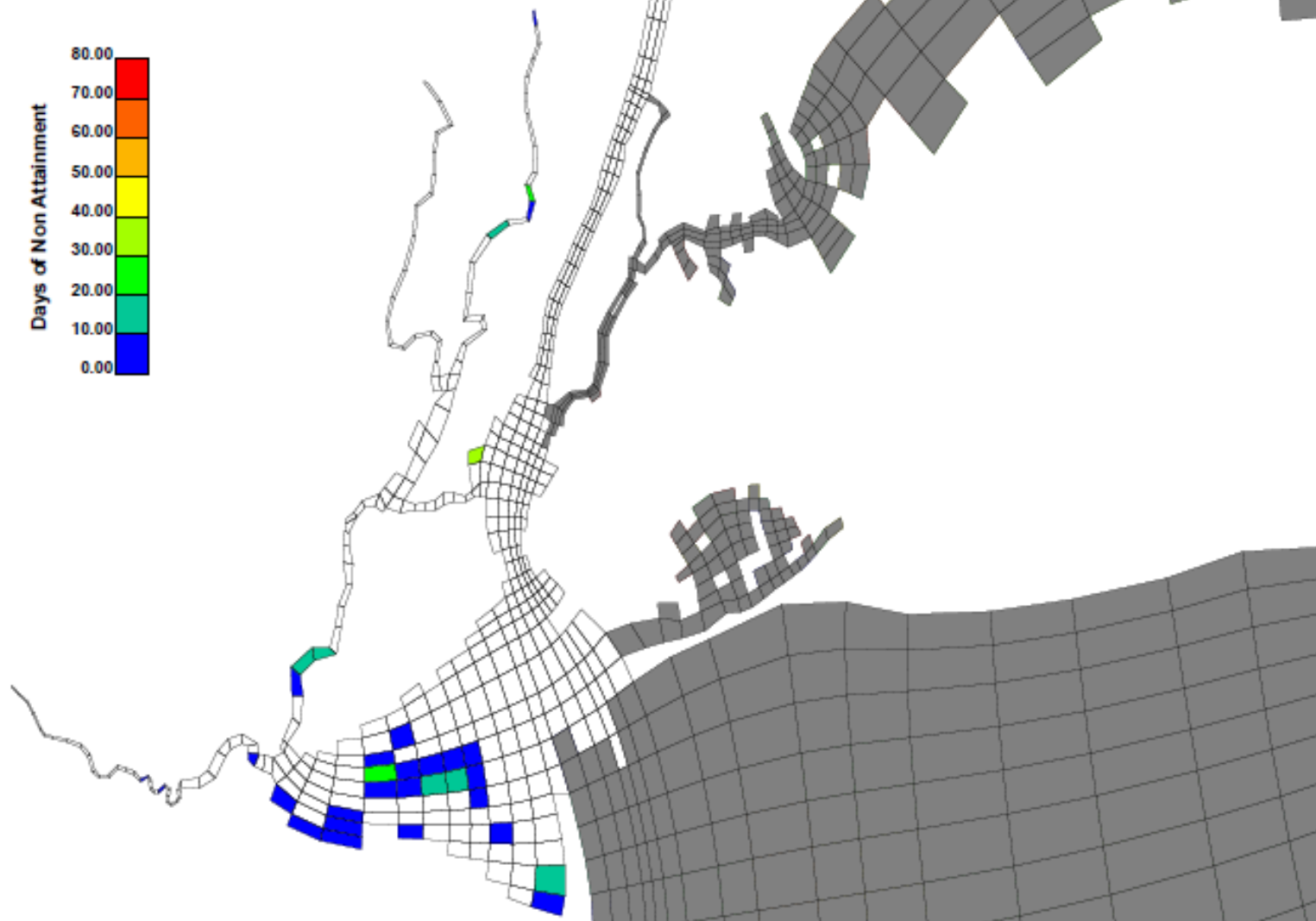


Max of New York State Chronic and Acute Criteria

Revised Sub-regional Plans (Step 5, 2/15/2010 memo), 1988 Hydrodynamic Conditions

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NYS Acute is based on instantaneous DO.

With plan, 1989 hydrodynamics

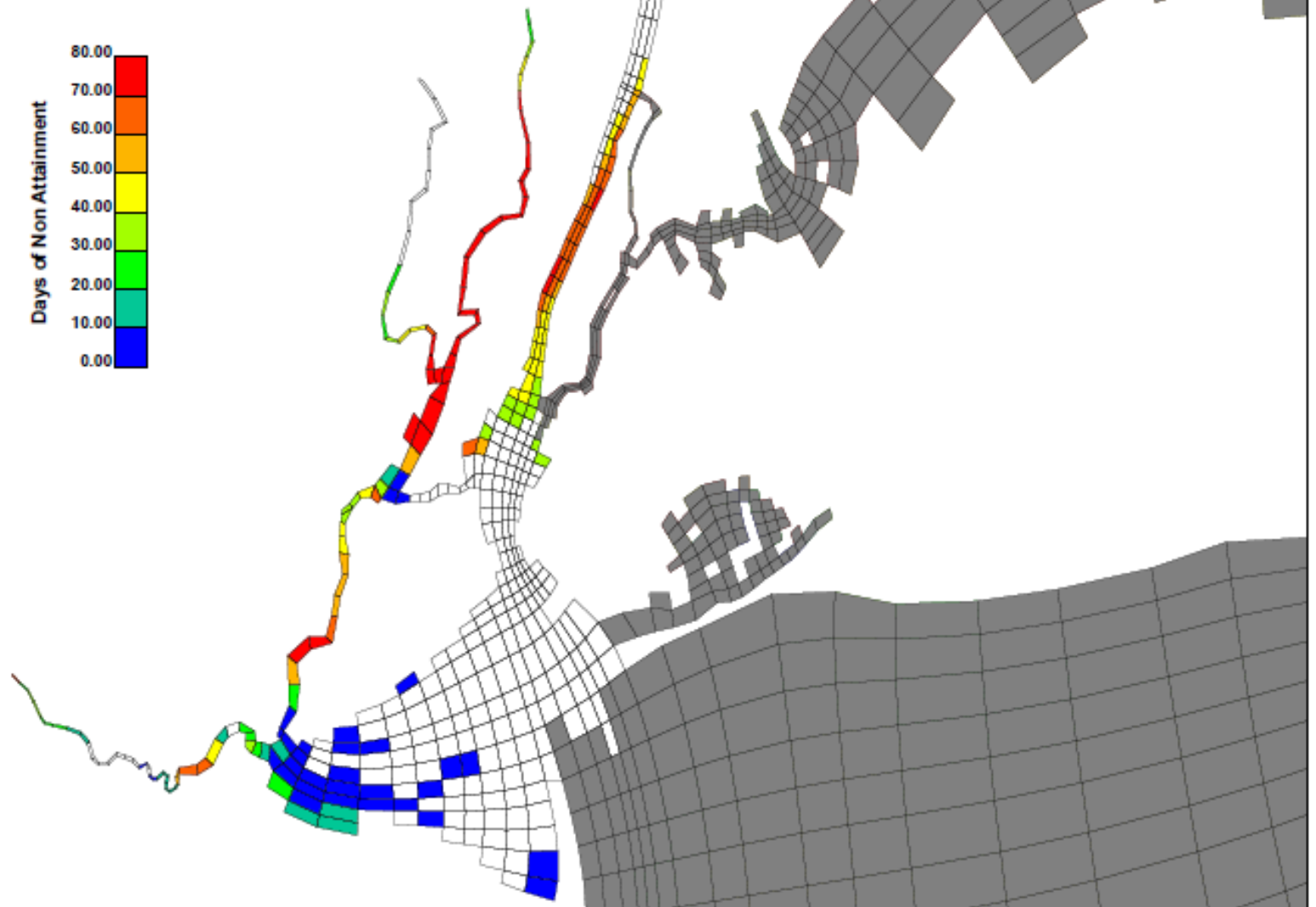


Max of New York State Chronic and Acute Criteria

Revised Sub-regional Plans (Step 5, 2/15/2010 memo), 1989 Hydrodynamic Conditions

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Without plan, 1988 hydrodynamics

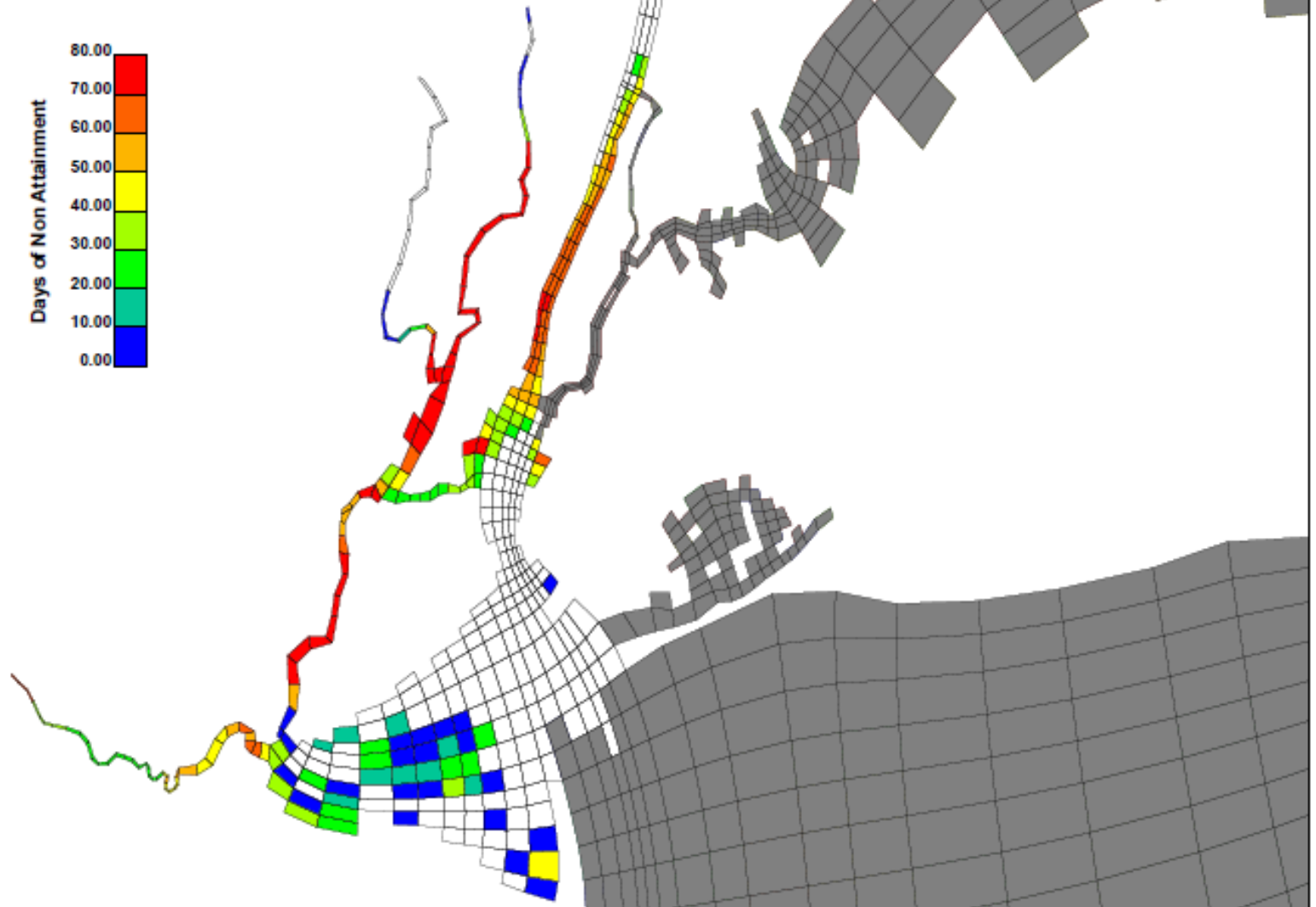


Max of New York State Chronic and Acute Criteria

NWG Baseline, 1988 Hydrodynamic Conditions

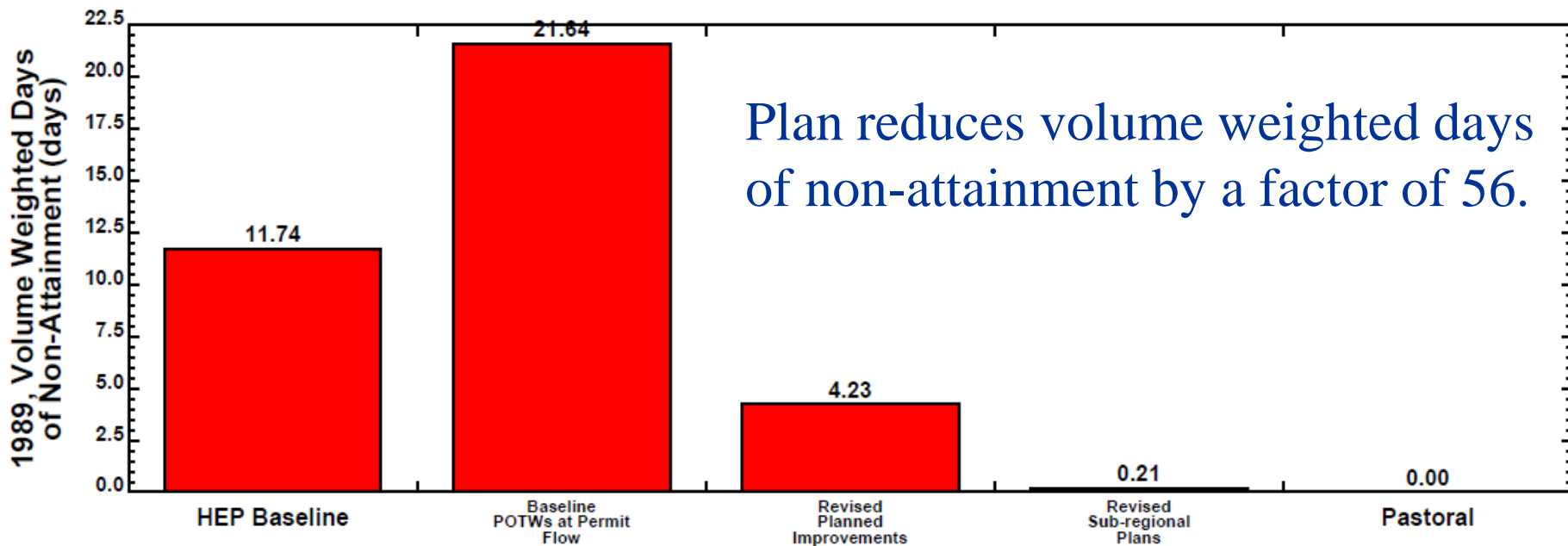
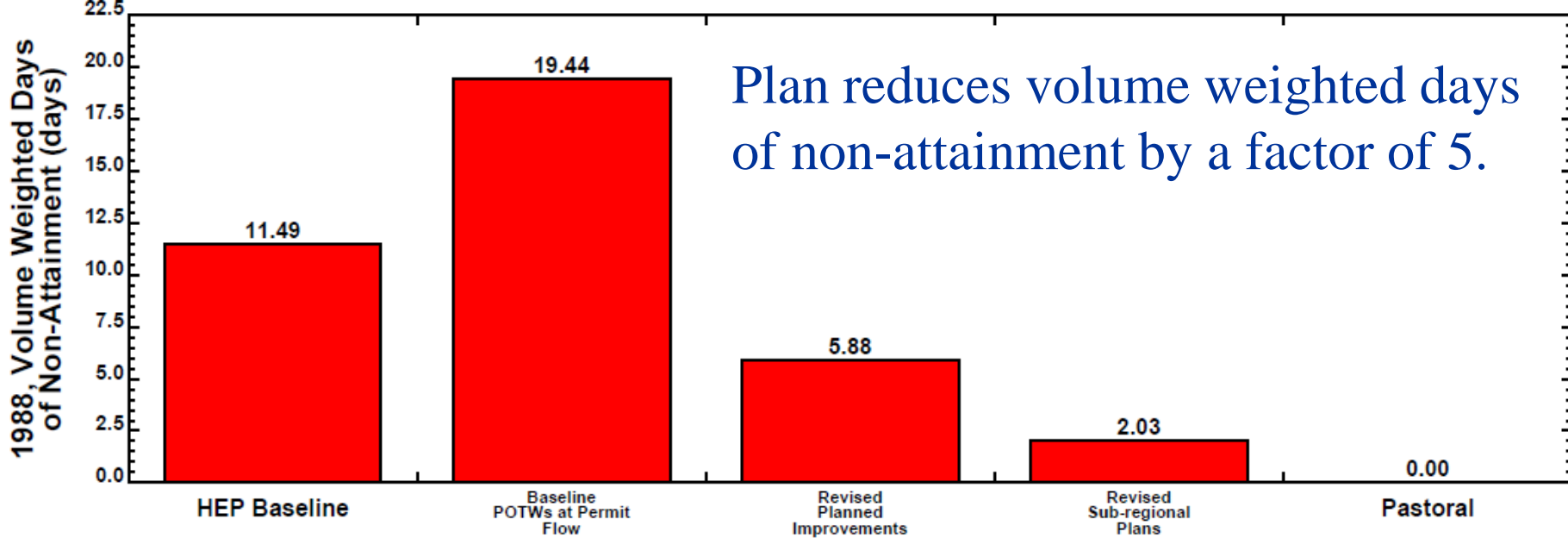
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NYS Acute is based on instantaneous DO.

Without plan, 1989 hydrodynamics



Max of New York State Chronic and Acute Criteria

NWG Baseline, 1989 Hydrodynamic Conditions



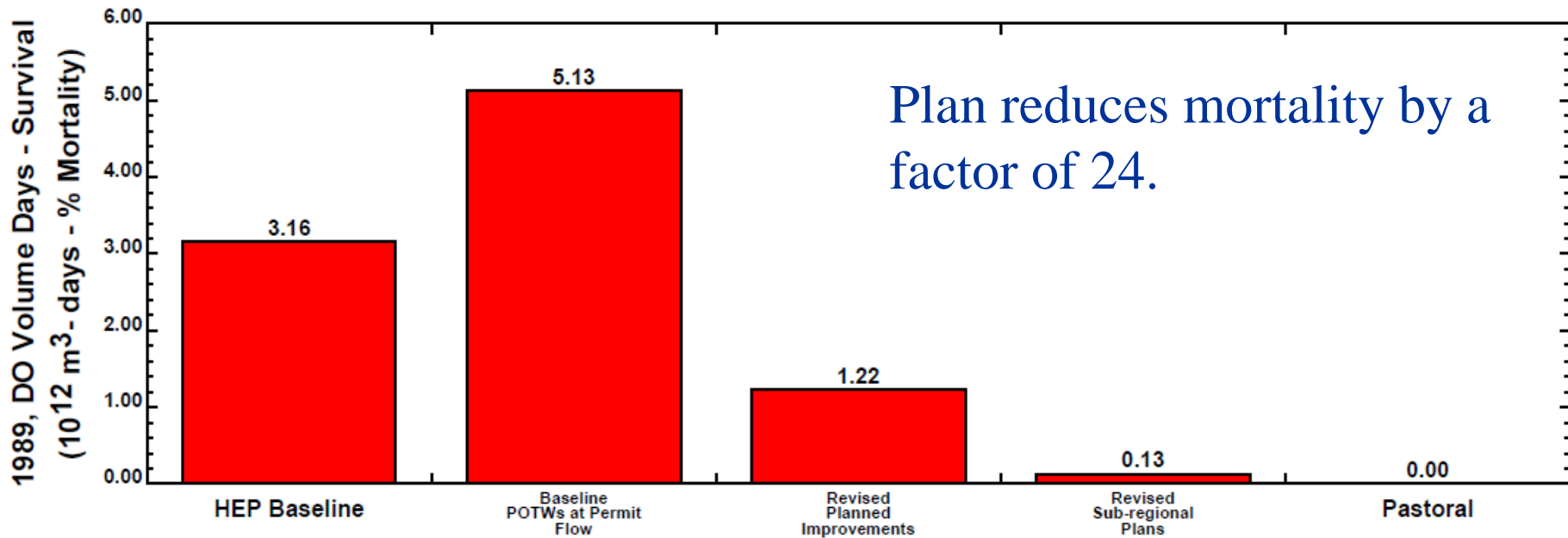
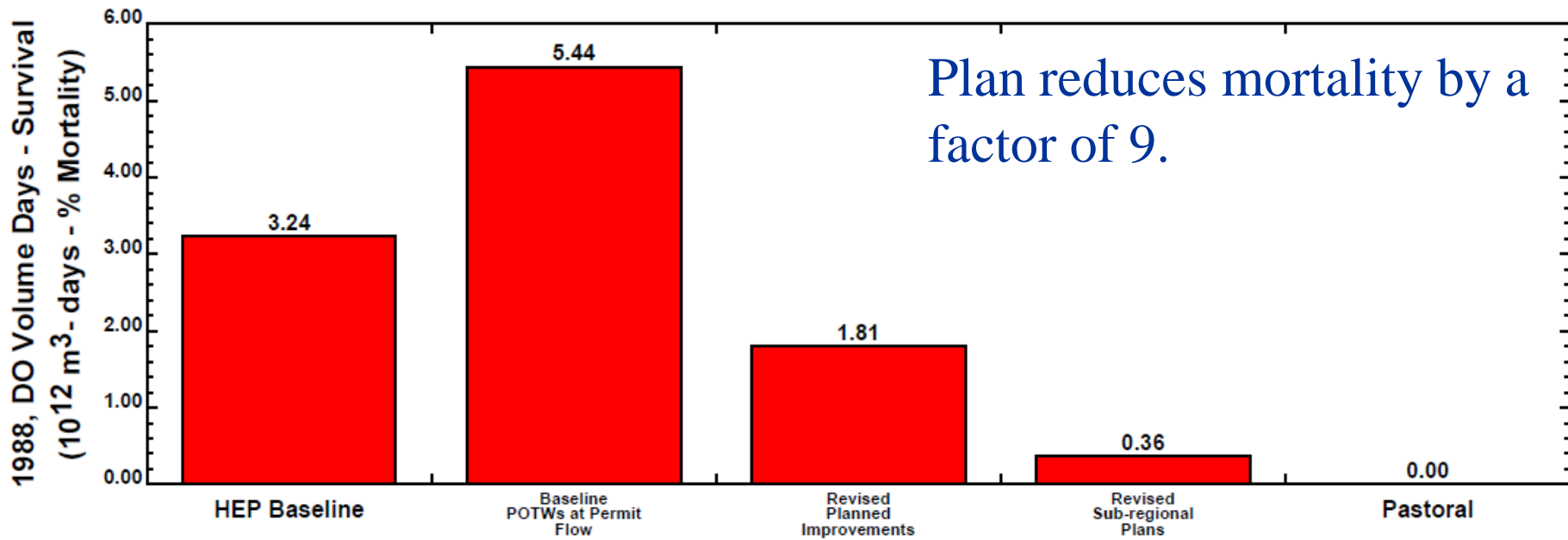
Arthur Kill Total Volume Weighted Days of Non-Attainment
Current Dissolved Oxygen Standards

Living Marine Resource Based Metrics

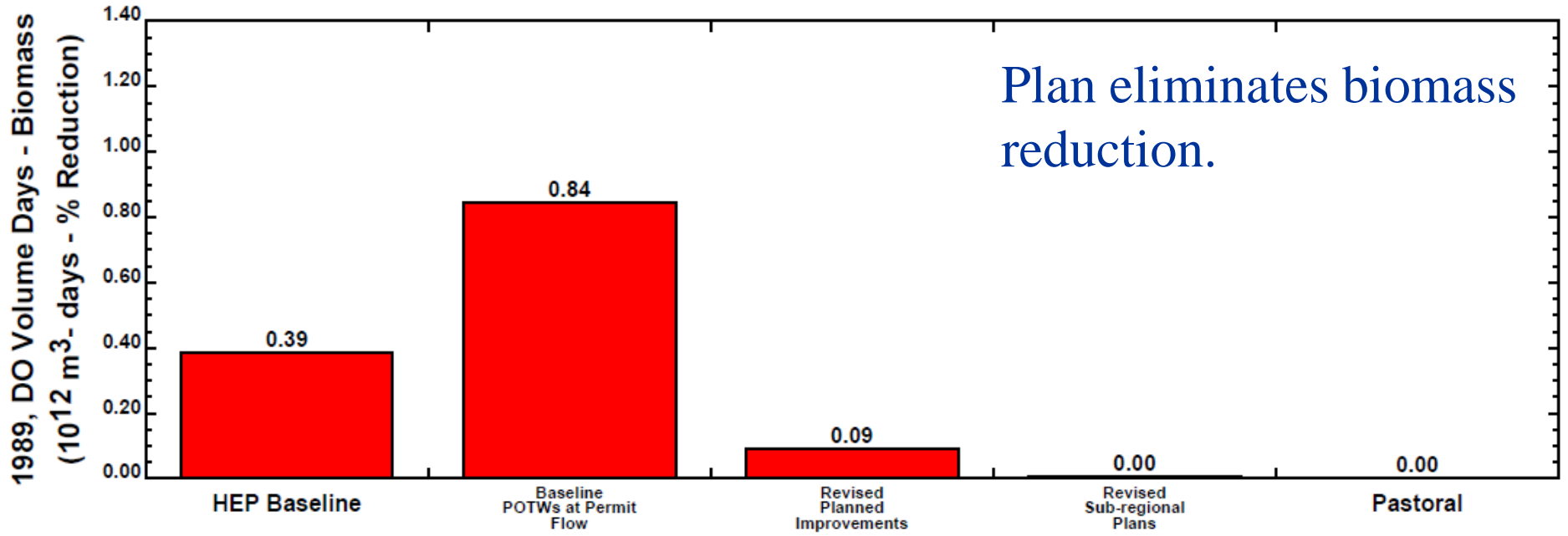
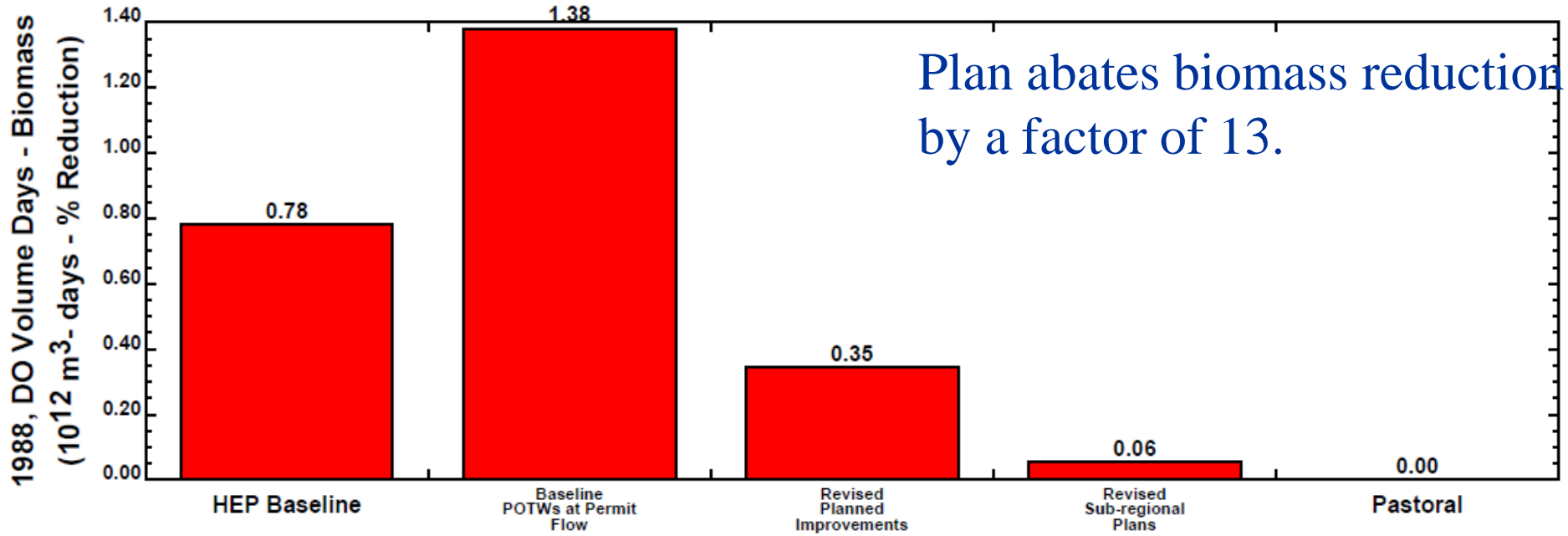
- Long Island Sound Living Marine Resources Workgroup developed percentages of mortality and biomass abundance reduction for several DO intervals based on site specific data.
- These percentages have been applied to Harbor plan results to assess expected plan improvements to living marine resources. Arthur Kill example shown here. Report includes others.
- Similar Harbor percentages may be developed in the future by HEP.

Living Marine Resource Based Metrics

DO Interval (mg/L)	Mortality	Biomass Reduced
0 – 0.5	100%	100%
0.5 – 1	100%	96%
1 – 1.5	100%	87%
1.5 – 2	98.5%	73.5%
2 – 2.5	88.5%	53%
2.5 – 3	70%	30%
3 – 3.5	50%	11.5%
3.5 – 4	35%	2%
4 – 4.5	23.5%	none
4.5 – 5	8.5%	none
> 5	none	none



Arthur Kill Total DO Volume Days - Survival



Arthur Kill Total DO Volume Days - Biomass

Plan Elements

- Plan developed based on sequential evaluations of individual management actions reviewed by Oversight Group last year.
- Plan C & N loading tables have been prepared (distribution pending) for each sub-region for: head-of-tide, stormwater, CSO, STP, atmospheric deposition
- Plan loadings are qualitatively described here

“Already Planned Improvements” Included in the Plan

- “No Net Increase” in other sources
- Clean Air Interstate Rule (CAIR) reductions to atmospheric deposition, overland runoff, and head-of-tide
- Upper Passaic River P TMDL
- Upper Raritan River P TMDL
- North Bergen STP effluent relocation to PVSC
- Updated Owl’s Head STP
- Jamaica Bay Consent Order
- Long Island Sound Nitrogen TMDL
- In-progress NYC CSO volume reductions
- SW MS4 reductions included (5%N, 10%C)
- Peconic TMDL included with LIS TMDL

The Selected Plan- Beyond Already Planned Improvements

Sub-Regional Improvements Simulated with SWEM	
SUB-REGION	IMPROVEMENTS
Hackensack River	BCUA and SMUA C & N LOT CSO C & N LOT SW C & N LOT
Passaic River and Newark Bay	CSO C & N LOT SW C & N LOT
Raritan River/Bay	MCUA N LOT CSO C & N LOT SW C & N LOT
Kill van Kull	None
Arthur Kill	LRSA, JMEU, RSA N LOT CSO C & N LOT SW C & N LOT
Hudson River/Upper Bay	PVSC, EMUA, NBMUA, Hoboken (NHSA Adams Street), West New York (NHSA- River Road), Yonkers, North River, Owls Head “C & N Low N”

Selected Plan Elements Modified per Previous Oversight Group Instructions

Raritan Bay

- LOT N (not LOT C too) at MCUA
- Omit Oakwood Beach STP reductions

Kills

- Omit LOT reductions at Kill van Kull STPs
- LOT N (not LOT C too) at Arthur Kill STPs

Hudson/Upper Bay

- STP “low N” C&N reductions (something less or trading still to be considered?)

Plan Definitions

- CSO LOT = 40%C, 25%N reductions
- SW LOT = 15%C, 20%N reductions
- STP LOT = plant specific per costing reports

Other Anticipated Work

- Distribution of loadings tables
- Ammonia toxicity evaluation
- Historic DO improvements narrative
- Drafting of plan/TMDL document
- Several implementation planning/post public document SWEM simulations